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cannot positively assert. There was likewise no visible sign of either Sex. Being dissected it afforded these following observations.

First the Guts were very much distended and transparent, and through them appeared the *Fæces* very liquid accompanied with no small quantity of Wind; the end of the *Rectum* was entirely closed like a bladder, and sealed as it were Hermetically, pendulous in the cavity, and not in the least continued to a Sphincter, of which there was no sign.

Secondly, there was no Bladder to be found, nor *Uterus*, or any mark of what Sex it was designed for.

Thirdly, to supply the place of a Bladder, both the *Ureters* were inserted into the *Rectum* within an Inch or thereabouts of the end.

Fourthly, the Stomack was full, even to distension, of an hard Substance, which being opened was exactly the same to appearance with hard press'd Curds.

Fifthly, the *Chile* came freely enough out of the *Ductus Pecquelianus*. where it was inserted to the *Jugular*, upon the smallest pressure of the *Intestines*.

Sixthly, I could not urge the liquid or Flatulent Contents of the Guts upwards within two Inches of the *Pylorus*, tho I pressed them till they brake, which hindred the inquiry after a *Valve* that possibly might be there to hinder the regrefs of any thing to the Stomack.

**FLETA MINOR, or the Laws of Art and Nature in knowing, judging, assaying, fining, refining, and enlarging the body of confined Metals &c.** By S<sup>r</sup>. John Pettus Knight, &c.

**T**His useful Treatise contains in general the whole *Art* of *proving* and *melting* all sorts of *Oars* and *Metals*, and is divided by the Author into *five* Books.

The

The First is of *Silver Oars*, where after a brief innumeration of the particular matter handled in it, He divides the *Oars* according to those differences which are most to be regarded by the *Miner*; viz. They are either *Easy-flowing Oars*, or *Hard-flowing Oars*. Of the first sort are reckoned *Glass-Oars*, which loose not above one sixth part in the Fire; The *White-goldish Oars*, so called not from their contents, but from their goodnels in *Silver*; *Horny-Oars*, named from their transparency; and *Red-goldish-Oars* like *Cinnabar*, which yield above half *Silver*; with many more, which are described by their sensible qualities, and are computed to yield from six to ten Ounces in a *Centner*, or hundred weight.

*Hard-flowing Oars* are all *Flinty-Oars* which are commonly rich in *Copper*, but yield very little *Silver*, not much more than half an Ounce in a *Centner*. Likewise all common *White-Glimmer*, or *Wolferan*, or *sparkling-Oars*, *Talk*, or *Cat-Silver* are very poor.

Next follows a description of the *Assay-Furnaces*, and all the Instruments necessary to the preparation, and proving of *Silver*, and other Metals; as *Muffles*, *Bottomplates*, *Tefks*, *Copels*, &c. All which, as to the shapes which the Antients did, and the moderns do, use; as also the matter out of which, and the manner by which they are made; are accurately taught, and commended or discommended, as they answered Experience.

For good *Copels* on which the Tryals will neither leap, nor sparkle, He particularly commends *Knuckle-bone* ashes, either from Sheep, or Calf; perfectly calcin'd, very finely powdered, and moistned with strong Beer.

The matter for the making *Copels* He calls *Clar*, for which, after the Tryal of other bones both of Beasts and Fish, He prefers *Calves-head-Bones*, or the Scales that come from their fore-heads as the best.

Then succeeds the preparation of *Lead-Glass*, or *Pluss*; ( which is a general term for any addition that makes the Metal

Metall Flow) of which there are two or three methods set down, together with the manner how to cleans it.

He describes the *Affay-Weights* with their Divisions. The *Centner Weight* consists of an Hundred pound divided downward. The *Penny Weight* is of two sorts, That used in *High-Germany*, the greatest of which is a *Mark* or 256 *Pence* the lowest an *Helter* or half penny: The *Low-Dutch Penny Weight* has for the highest a *Mark*, or 288 Grains; for the lowest half a Grain.

*Silver-Oars* he tries in short thus: A small quantity, the proportion of which to the *Centner* is known, is to be put upon a *Test*, and melted with its due weight of *Lead*; this being done, the *Lead* well cleansed from its *Slacks* or *Dross* is to be assayed upon the *Copel*, on which the *Silver Grain* will remain, which is the true *Content* of the *Oar*.

He discourses how mixt Metals are to be assayed for *Silver*, as also how *Coin'd money*, *Plate*, burnt *Silver* &c.

How the *Silver Touch-needles* are made. How mixed with their proportion of *Copper*, and used. How *silver* is to be separated from other Metals, and burnt clean under the *Muffle*. The way by which good *Proof-Ballances* are to be made, and fitted with all possible exactness, as also are the *Proof-Weights*; the division of which from the highest to the lowest he prefers in making them; but they are to be proved when made, from the smallest to the greatest.

The Second Book is of *Gold-Oars*, the method the same with that of the first. He asserts on his own experience that no *Oar* hath *Gold* alone, without other Metals incorporated unless the *Gold* is sensible; and even that is not wholly clean, but most commonly *Silvery*.

The *Fair-Gold* is found standing in a *Whitish Flint*, sometimes in a *Blew* and *yellow Horn-stone*, and also in a *Blew Shiffer-streamy* and *Yellow Iron*, but very small and flaming, as in the Mine at *Knein* in *Bohemia*; there is also found a *Greenish-Silvery-Flint*, which after it is ground and washed, yields a fair high *Duke-gold* which at the first digging is not perceived in the *Flint*.  
He

He tells us that *Gold-washers* go about the Country, and get their living by washing Gold, together with their manner of washing it; with a description of that compendious *Wash-work* by a *Rattar* or Sieve made of Brass wire, with a flat Hearth under it, and a Channel for the Water; this serves for *sandy Works*.

That Gold Oars out of the *Veins* are to be prepared two ways, either by a *Wet* or a *Dry Bucking*; *Flinty* and *Horn stony* Gold Oars are first to be *Roasted* and suddenly *Quenched* to make the Oar run together, and the Flint brittle.

He also shews how *Gold Slicks* may be made to profit with and without *Quick-silver*. That there are two sorts of *Touch needles* for Gold, the *White* and the *Red*, so called from the excess of *Silver* or *Copper* in their Composition. That the *Black Touch-stones* are best, tho not all equally good: if they are too weak, no Gold toucheth bright upon them; if too hard, the *Hungarish* and other weak Golds will not touch true.

He farther instructs how to prove Gold by *Aqua-fortis*, and the Goldish Silver by washing it in common water; How to find whether Silver contains Gold without the *Water proof*, namely by drawing a Wire of true Gold, and another of the Silver you would prove, through the same hole, and then finding the difference by weight.

Several ways and Instruments are taught for the making *Aqua-fortis*, though *Iron Jugs* are preferred for this reason among others, that *Aqua-fortis* distilled out of them, makes the Gold of an higher Colour.

To make an excellent strong *Aqua-fortis*, he commends *Calcin'd Vitriol*, *Nitre*, *Alum*, and *burnt Flints*; after the Distillation; it is to be digested, and rectified from fresh *Nitre*, *Vitriol*, *Burnt Flints*, *Verdigrise*, roasted *Antimony*, filed *Iron*, and *White-lead*. *Aqua Regis* is made by the addition of Salt to good *Aqua fortis*. &c.

Then *Cementing* is mentioned, what it is, and how performed. That to it is required such matter as will work upon Silver

Silver and Copper by reason of the *Salts* it contains, yet not touch the Gold; such as *Verdigrise*, *Lapis Hematites*, *Crocus Martis*, *Tutia* or calcinated *Vitriol*. With a description of the *Cementing Oven*, and how it is to be governed; How to *Graduate* Gold and give it an higher colour; How to make *brittle* Gold *dest* and fit to be wrought, by melting it with *Nitre* and *Calx viva*, and other waies.

Lastly how to cast Gold through *Antimony*; which has been accounted the best if not the only means to make it very clean and fine; this the Author allows to be true, when the *Antimony* is good, but not else; and because *Aqua Regis* toucheth Gold only and nor Silver, therefore He judges it may be made purest and finest that way.

The Third Book is altogether of *Copper-Oars*, with their description and the manner of *assaying* them, with many Instructions how to separate other Metals from them; but the Instruments and operations being much the same with what went before, a more particular account will be but repetition. We shall only add, that he gives a singular way of melting in the *assaying-Work*, and teaches how *Copper* is to be made *Brass*, by the addition of the *Lapis Calaminaris*; by which addition the Metal is usually encreased Sixteen pound in a Centner.

The Fourth Book Treats principally of *Lead-Oars*, and briefly likewise of *Tin*, *Antimony*, *Quick-silver*, *Iron*, *Steel* and the *Lead stone*.

The *Bright-Lead-Oar* he says is the best, and contains above half *Lead*; besides which there is *White-Lead-Oar*, like a *sand-stone*; and *Red-Lead-Oar* like a reddish Clay; these are not so rich as the first, as neither is a *Yellow-Lead-Oar* mixt with *Gray*, which is called the *Lead-Ram*.

Then follow all the ways of *proving* it, as also the *boyling* and *smelting* it, with the cautions to be observed in the *Beat-works* &c. In his Chapter of *Magnets* he quotes a passage out of *Serapion*, how by calcining a *Magnet* with an equal portion of *Calx viva*, and after adding the like weight of yellow *Sulphur*, there will arise a preparation which with the least drop of *Water* shall immediately take *Fire*.

The Fifth and last Book is of *Mineral Salts* : as *Salt-petre*, *Nitriol*, and *Alum*. He describes *Salt-petre* to be a *Stone-Salt*, which hath in it self a fullen fire : tells you of what earths it is best made, how those Earths and the *Lees* made of them are to be proved ; with the way of boyling the *Salt-Petre*, and purifying it when boyled. And in the last Chapter, he describes the *Roasting* and *trying* *Flints* for *Vitriol* and the *Alum-Earth* or *Shiffer* for *Alum* : which Earth is neither to be roasted nor yet to be boyled Raw, but must be laid in an heap together, to be weathered and warmed in it self, that it may fall asunder and break out, and then you may make *Lees* of it. Besides this the whole work is every where illustrated with *Sculptures* both of the instruments and operations.

The Translator *St. John Pettus*, has added a *Dictionary* of the *Metallick* words, which he calls the *Second part* ; and has divided the Tract it self into Chapters and Sections, and pointed it (all which, he tells us) were wanting in the *Original* ; and hath promised likewise the *Contents* both of those Chapters, and Sections, as also of the *Sculptures*.

He farther promises to publish *Agricola* in *English*, within the compass of a Year, it being already fully Translated.

*Benjamin a Brookhuysen Oeconomia Animalis &c. in 4° 1683.*

THE Author of this Book, being most addicted to the Principles of *Des. Cartes*, proposeth (by a great variety of discourses) several ways and declarations, what the true notion of a *Spirit* and a *Body* may be ; and how the *Soul* and *Body*, as two different *Substances*, may be joyned together, so as to perform all the *animal functions*, that commonly are observed as well in Man, as in all other sorts of Beasts, and living Creatures. To this purpose he divideth his Book into 121 *Articles*, adding to every one, (where he is inquiring the *Notion* of the *Soul*) a large discourse, to make us better understand what he hath said and asserted in the Articles. So from the first to the 12 Article, he explaineth by what way or means one must begin to form *Philosophical conceits* : As, that no Principles of any Science must be taken for *granted* ; and that the most *simple notions* that can be found out, must be the only rule of an *intellectual progression*. And whereas true Philosophy requireth a conformity of the objects with reason, so a right judgement about any thing must agree with the perception of it : And hence all prejudices, customs, opinions of several Sects, the veneration towards Antiquity

tiquity, and other fancies of man, must be all laid aside ; and the most simple and clear perceptions will serve for a true reformation of Philosophy. In consequence whereof, The Author saith, that the first thing which is known to us, is the *Conscience* which we have of *thinking*, or that we *Know* that we have any *thoughts* : which he beleiveth to be the most exact Character of a Soul ; so that the same rather should be described or called *ipsa cogitatio*, then *res cogitans* : for this *cogitatio* or Act of *thinking*, he saith, to be the same thing with the existence of the Soul ; which cannot be demonstrated to another, though every one by himself is convinced, that he *thinketh*, or hath an *existence*. For this Proposition, *ego cogito, I think*, being a particular one, is more certain than that general notion, *Omne cogitans est vel existit*; and so it needs not any farther explication, *Quid sit existere sive cogitare*. Afterwards *Artic. 13* he inquireth, How this Act of *thinking* becometh to be so *continual*, as that no space of time can interrupt the series of *thoughts*. The cause of which, he deriveth first from *God*, as the only Principle of all *Being* ; and then from the Nature and Essence of the *Soul*, which is kept by such a divine vertue in *continual activity* : when all the variations which arise about the *thoughts* of man, are nothing but *Modifications* of one and the same Essence ; so that a thing that once doth *really exist*, can never be brought to *nothing* again ; the death or destruction of a thing being only a bare name, signifying nothing but a dissolution of things that formerly were mixed and tyed together ; and by this the variety of *modifications* or *thoughts* do suppose and require always the *conscience of thinking*, which is properly the Essence of the Soul, lasting for ever. *Artic. 14* and the following, he inquireth about the *difference* of *thoughts*, and why *one thought* is to be accounted to be *better* than *another* ; Where he sheweth, that the prerogative or excellency of one above another is derived from the nobility of the *object* that is concerned in the thoughts : and whereas the same cannot be multiplied, he thinks it evident, that the whole *System of thoughts* is only a continuation of the same substance, variously modified, according to those things that are within, and without, or about us. And in the same manner as our *thoughts* do prove our *existence*, so there are certain *thoughts*, which do confirm that there are things *above us*, or *more perfect* then we can fancy our selves to be. Amongst w<sup>ch</sup> is that *thought* or *idea* of an *Infinite Being*, w<sup>ch</sup> convinceth us, that there needs must be a *God* ; because no body being able to give or produce that in himself, which is beyond his reach, this *Idea Infiniti* doth argue some higher Principle, of an infinite power. By such and the like Arguments after the *Cartesian* way, he goes on to demonstrate the Proprieties and Attributes of God, till *Artic. 19* he comes to prove the *existence* of a *sensible body*, for we find that to the direction of our Senses we meet with such and such *thoughts*, so that against our will sometimes things are presented to us, which we cannot *leave*, but are forced to *think* on ; which proveth both the *Union* of our *Soul* to



*the Body*, as the *existence* of this *sensible World*: for according as our *Senses* are altered by the presence or disposition of the *Objects*, so differently do we find that we have *thoughts*, that are related to them; so that our *perceptions* cannot be continual dreams, but must really answer the impression made by the object. But making farther an abstraction of all *sensible bodies*, he findeth *Artic. 20* that *extension* is as true a Character of them, as the *Act of thinking* is of the *Soul*: out of which *extension*, with some Principles of *Natural notions*, he is confident that all the *Phænomena* in Nature may be deduced and explained. And because it is very hard to give a rational account, how these *two Substances Soul and Body*, differing so much one from another, maybe *joyned together*, he talks, *Art. 23*, of *several degrees*, by which this *Union* is to be facilitated; proposing a perfect harmony betwixt the variety of parts continually moved in the body, and the *perception* altered by such relations in the Soul. Which *Mechanical Analogy* he declareth from *Art. 29* to the end of the Book; shewing how *Respiration* and *Attraction* of the Air, The *Nourishment* of the body by *Eating and Drinking*, The *Digestion*, *Fermentation*, *Sanguification*, *Circulation* of the blood, be the causes of all *Diseases and Sickneses*; as *Feaver*, *Apoplexy*, *Consumption*, *Pleurisies*, and other *Infirmities* are produced: and how the *animal Spirits* are generated in the *Brain*, and afterwards through the whole body dispersed, do serve for the perfect *Oeconomy* of the Body, and in all *Passions* of the Soul. Amongst all these explications, the Author sometimes does correct the errors and mistakes of other Physicians, especially about the generation *ex semine & ovo*. For the rest, the whole book seemeth to be a meer explication of *Des-Cartes* his opinions.

### ERRATA.

P. Ag. 153. l. 22. or the l. 28. translated. P. 164. l. 14. to him. P. 168. l. 35. evil, P. 173. l. 35. (d). P. 176. l. 9. situated. P. 178. l. 18. Pupilla. P. 179. l. 19. Hypothesis. P. 179. l. 32 or P. 188. l. 19. Species. P. 190. l. 35. Succeeds.

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